




BMP #42 - Catchbasin Inserts

Targeted Pollutants	
35% Sediment	
5% Phosphorus	
 Trace metals	
 Bacteria	
 Petroleum hydrocarbons	

Physical Limits	
Drainage area	5,000 s.f.
Max slope	N/A
Min bedrock depth	N/A
Min water table	N/A
SCS soil type	N/A
Freeze/Thaw	fair
Drainage/Flood control	no

DESCRIPTION

These BMPs are devices installed under a storm drain grate that provide water quality treatment through filtration, settling, or adsorption. Catchbasin inserts are commercially available products and are generally configured to remove one or more of the following contaminants: coarse sediment, oil and grease, and litter and debris. Units must be routinely maintained to achieve maximum removal efficiency. Maintenance frequency will vary depending on the amount and type of pollutant targeted. There are many variations of inserts, as shown in the attached figure.

APPLICATIONS

Studies performed by King County, WA have found catchbasin inserts to be nominally effective at removing fine (silt and clay) sediment and associated pollutants. Inserts were successful in capturing coarse material and debris. Petroleum product removal efficiencies for inserts in good condition ranged from 20 to 90 percent when exposed to oil concentrations near the high end for urban runoff and performance dropped off rapidly with use. Possible locations for catchbasin insert implementation include: parking lots, gas stations, golf courses, streets, driveways, industrial or commercial facilities, and municipal corporation yards.

LIMITATIONS

The greatest difficulties facing those implementing catchbasin inserts for stormwater treatment lay in the small physical space inside the catch basin, the tendency for sediments to clog or blind filter media, and the fluctuating nature of the flow. Catchbasin inserts are very maintenance-intensive. The problems may be compounded from street sanding and other activities.

DESIGN PARAMETERS

The catch basin insert must meet the following criteria.

1. The total maximum tributary area should be 5,000 square feet (465 m² (+ 5 percent) per unit for new development projects and 7, 000 feet (650 m²) per unit for redevelopment projects.
2. A catch basin insert for a new development project should be designed to fit with a standard grate. If the insert is installed in an existing catch basin, the insert should be demonstrated to fit properly so that there is a positive seal around the grate to prevent low-flow bypass. The maximum height of the grate above the top of the frame, with the insert installed, should not exceed 3/16-inch (4.8 mm), and the grate should be non-rocking.
3. The bottom of the filter media (oil absorbent/absorbent material) must be above the level of normal low flows. If the media is above the crown of the outlet pipe, it is assumed to be above the normal low flows. An alternative method to demonstrate that the media is

above the normal low flow is to show (by backwater analysis method described in Section 4.3.4) that the bottom of the media is above the water surface elevation corresponding to the water quality design flow.

4. The catch basin insert should be located to be accessible as needed for maintenance and not limited by continuous vehicle parking. This may require elimination of a parking stall for redevelopment projects.

DESIGN PARAMETERS

While no pretreatment is required with a catch basin insert, the use of source control BMPs on the site will decrease maintenance needs.

MAINTENANCE

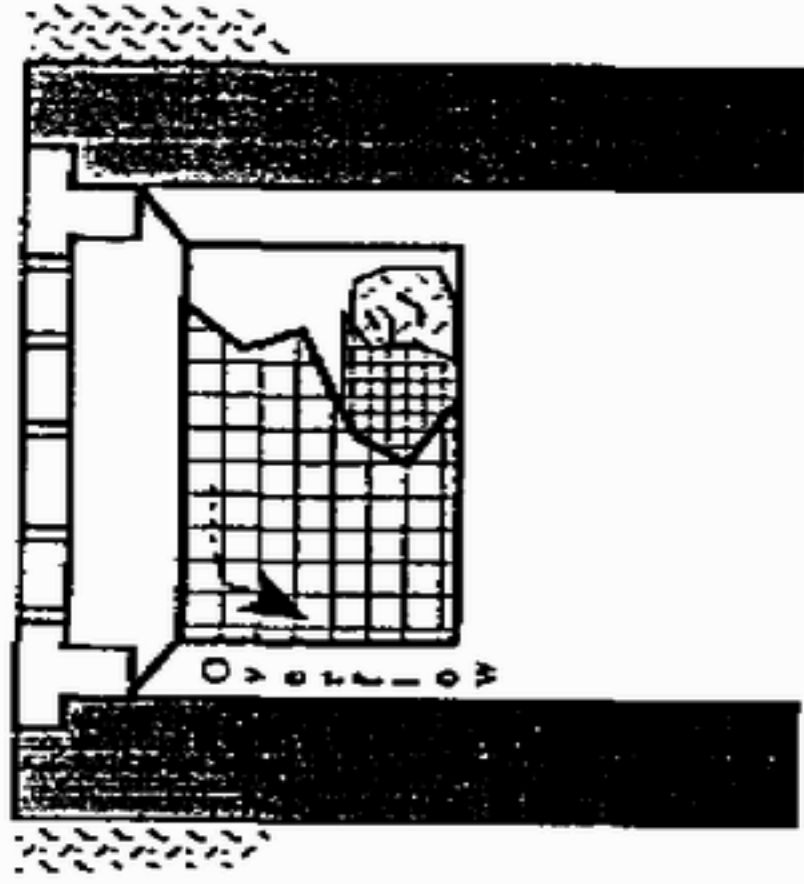
The catch basin insert should be fitted with oil-absorbent/absorbent filter media, to be inspected monthly and changed whenever the filter media surface is covered with sediment. Inspections are especially important during the wet season. Acceptable filter media include absorbent W, whole fibrous moss (not necessarily sphagnum moss), Petrolok, and general purpose absorbent (i.e., wood fiber).

CONSTRUCTION

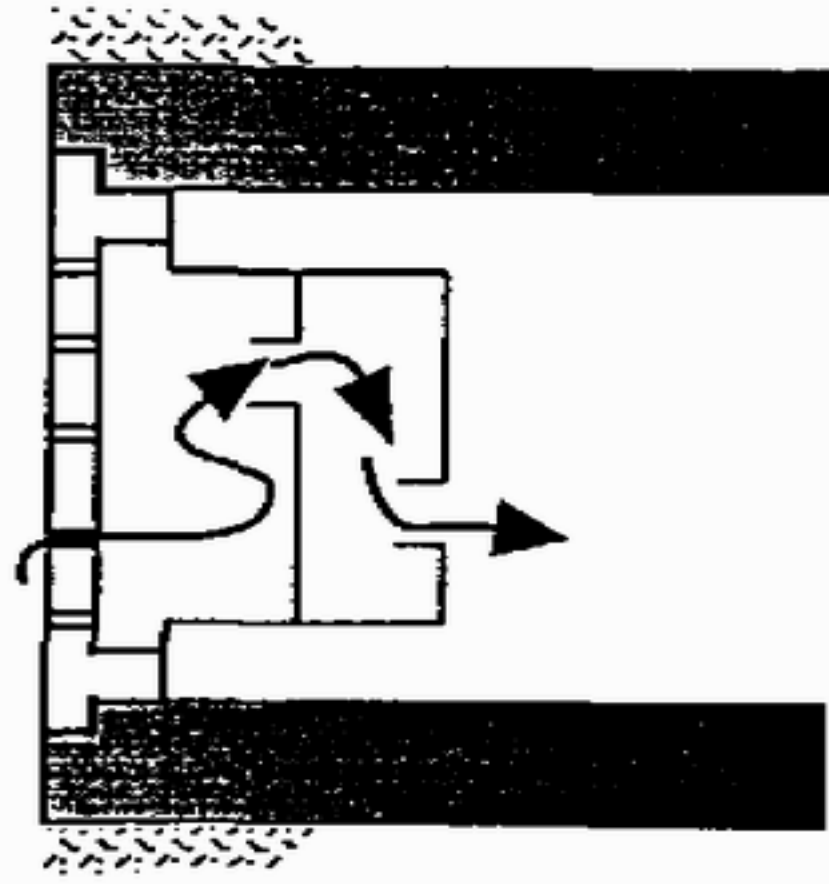
Installation of a catch basin insert for a new or redevelopment project should follow the manufacturer's recommended procedures. The catch basin insert should be installed in the catch basin after the site has been paved or stabilized (for new development) or after completion of construction (for a redevelopment site that is already paved).

If the catch basin insert is used for sediment control during construction, it should be reconfigured in accordance with the manufacturer's recommendations. When used for sediment control, the insert should be inspected at least weekly and maintained if needed.

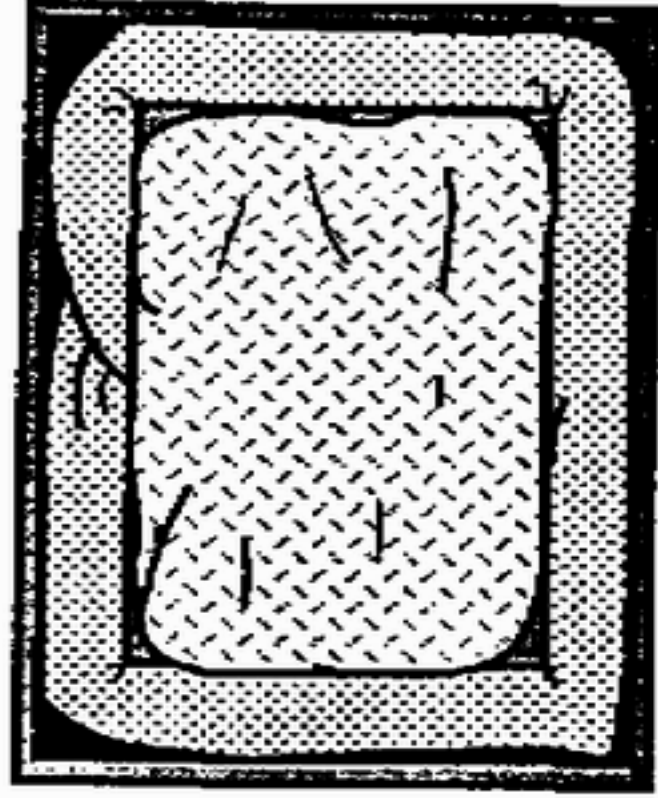
To minimize the generation of solid waste and the consumption of natural resources, systems constructed of or using recycled products are preferred. Reusable filter materials should be refreshed according to the manufacturer's instructions.



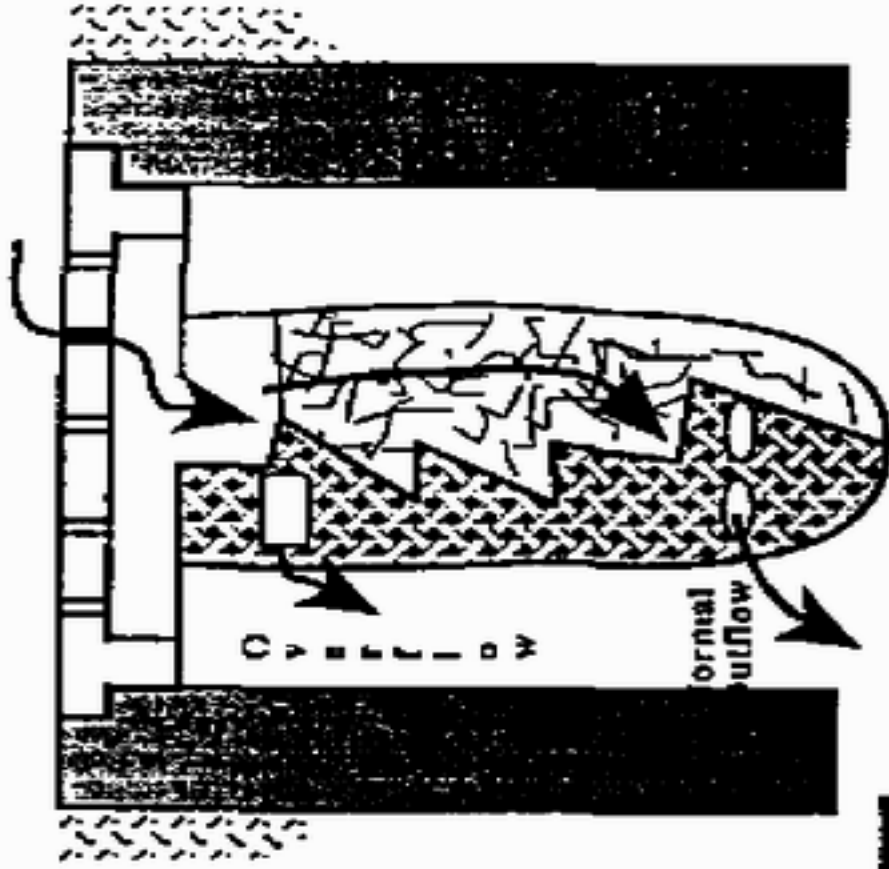
a. Aqua-net Gullywasher Model 10001
Side view with cut-outs to show interior



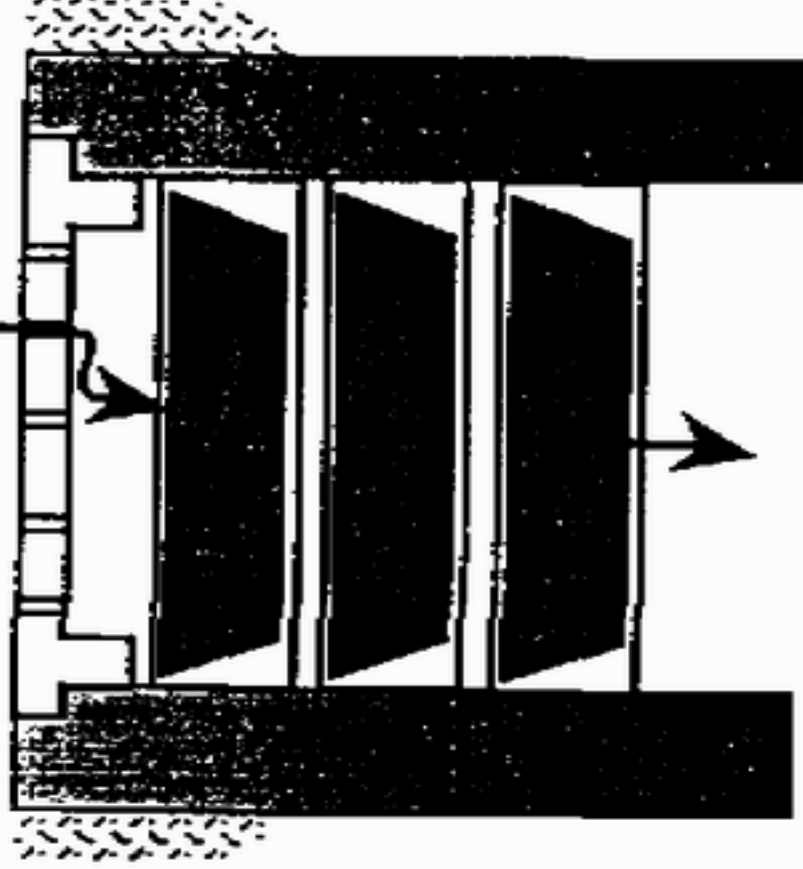
d. Stormwater Services type I
Cross section



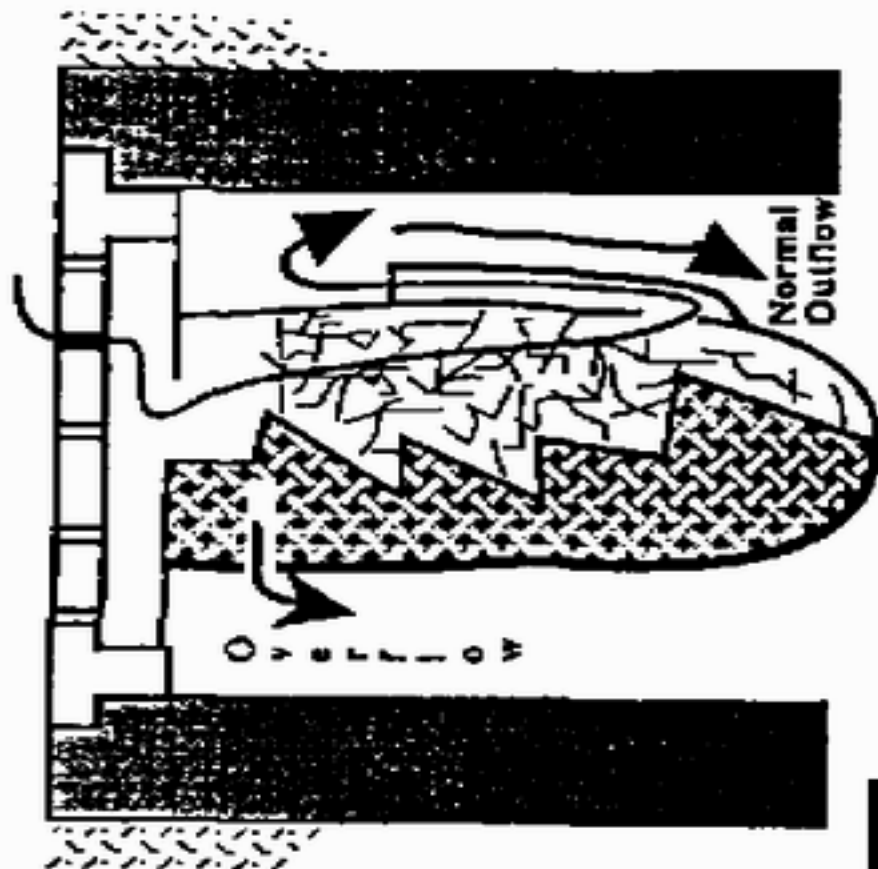
b. Aqua-net Gullywasher Model 10003
Top view shows revised containment system



c. Stormwater Services Type II
Side view with cut-outs to show absorbent



e. Enviro-drain
Side view



f. StreamGuard (replaced e)
Side view with cut-outs to show absorbent

Figure Detail Notes

- a) Aqua-Net Gullywasher Model 10001: A wire mesh outer basket fitted with an inner basket made of fine stainless-steel screen. The inner basket contains an "onion sack" filled with an absorbant made from a wood by-product. The primary outlet is through the bottom of the sack, while high-flow relief is through the sides of the upper part of the wire mesh basket.
- b) Aqua-Net Gullywasher Model 10003: A more advanced version of the "Gullywasher" described above. In this version, the stainless steel inner basket has been replaced with a second wire mesh basket. A long sock filled with oil-absorbing material is coiled between the inner and outer basket. As with the above product, an "onion sack" filled with absorbant is inserted in the bottom of the basket. The primary outlet is through the absorbant in the bottom and sides. High-flow relief is through the upper part of the basket.
- c) Enviro-Drain: A system of up to three trays, each with solid sides and mesh bottoms. The trays may be filled with an absorbant, activated carbon, or used simply as a debris-catching screen. The screens may be changed to meet specific site conditions. The system is typically installed with the top tray in a screen-only configuration, and the second two trays filled with an absorbant. All components are stainless steel.
- d) Stormwater Services Type I: A set of two interlocking trays that create standing water in which solids are allowed to settle. The overflow from the upper tray discharges to the second tray. The trays are molded in a standard size from recycled plastic. A variety of steel adapters allow the unit to be used in larger drain inlets.
- e) Stormwater Services Type II: A filter fabric sack filled with a polypropylene absorbent. Primary discharge is through the small holes near the bottom of the sack. A secondary outlet is near the top of the device. This model was discontinued during the study.
- f) StreamGuard: This product replaced the Stormwater Services Type II-O, with the principle difference being that the primary outlet has been routed through a pocket on the outside of the sack. A secondary outlet is still provided near the top of the device.